

Guideline for Hand Hygiene in Healthcare Settings

Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) and the Hand-Hygiene Task Force: HICPAC; Society for Healthcare Epidemiology of America (SHEA); Association for Professionals in Infection Control and Epidemiology (APIC); Infectious Diseases Society of America (IDSA).

Each year, approximately 2 million healthcare-associated infections and 90,000 related deaths occur in the United States. Hand hygiene is among the most important strategies to prevent healthcare-associated infections, but healthcare worker adherence to recommended hand-washing procedures has remained unacceptably low.

This article summarizes the evidence-based recommendations contained in the Centers for Disease Control and Prevention's (CDC) Healthcare Infection Control Practices Advisory Committee's (HICPAC) new Guideline for Hand Hygiene in Healthcare Settings.¹ Each recommendation is categorized on the basis of existing scientific data, theoretical rationale, applicability, and economic impact, using the HICPAC ranking system (Table 1). These recommendations are designed to improve hand-hygiene practices of healthcare workers and thereby reduce transmission of pathogenic microorganisms to patients and personnel in healthcare settings. The guideline provides an in-depth review of data on hand-hygiene practices and adherence of healthcare workers and specific recommendations to promote improved hand-hygiene practices in healthcare settings. The guideline provides evidence for and strongly recommends the use of alcohol-based hand rubs ($\geq 60\%$ alcohol content) for hand antisepsis when healthcare workers' hands are not visibly soiled; alcohol-based hand rubs reduce many of the reported barriers to healthcare workers adhering to recommended hand-hygiene practices. Compared with soap and water hand washing, alcohol-based hand rubs are more effective at reducing bacteria on hands, cause less skin irritation, require less time, and can be made more accessible. Recommendations con-

Table 1. Ranking Scheme Used for Healthcare Infection Control Practices Advisory Committee Recommendations

Category	Definition
IA	Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies.
IB	Strongly recommended for implementation and supported by certain experimental, clinical, or epidemiologic studies and a strong theoretical rationale.
IC	Required for implementation, as mandated by federal or state regulation or standard.
II	Suggested for implementation and supported by suggestive clinical or epidemiologic studies or a theoretical rationale.
No recommendation; unresolved issue.	Practices for which insufficient evidence or no consensus regarding efficacy exist.

cerning surgical hand antisepsis, the use of hand lotions or creams, and wearing of artificial fingernails also are included in the guideline.

As part of the recommendations, CDC is asking healthcare facilities to develop and implement a system for measuring improvements in adherence to these hand-hygiene recommendations. Some suggested performance indicators are provided in the guideline. The guideline was codeveloped with the Infectious Diseases Society of America (IDSA), the Society for Healthcare Epidemiology of America (SHEA), and the Association for Professionals in Infection Control and Epidemiology (APIC) and endorsed by the American College of Surgeons.

The full-text version of the guideline is available online at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5116a1.htm>. The Guideline for Hand Hygiene in Healthcare Settings is not intended for use in food processing or food service establishments, is not meant to replace guidance provided by the Food and Drug Administration's Model Food Code, and does not apply to consumer use of the products discussed.

Members of the Advisory Committee and Task Force are listed in the Appendix at the end of the article.

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RECOMMENDATIONS

1. Indications for handwashing and hand antisepsis

- A. When hands are visibly dirty or contaminated with proteinaceous material or are visibly soiled with blood or other body fluids, wash hands with either a nonantimicrobial soap and water or an antimicrobial soap and water (IA).²
- B. If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands in all other clinical situations described in items 1C–J (IA).^{3–10} Alternatively, wash hands with an antimicrobial soap and water in all clinical situations described in items 1C–J (IB).^{3,11–13}
- C. Decontaminate hands before having direct contact with patients (IB).^{14,15}
- D. Decontaminate hands before donning sterile gloves when inserting a central intravascular catheter (IB).^{16,17}
- E. Decontaminate hands before inserting indwelling urinary catheters, peripheral vascular catheters, or other invasive devices that do not require a surgical procedure (IB).^{18,19}
- F. Decontaminate hands after contact with a patient's intact skin (eg, when taking a pulse or blood pressure, and lifting a patient) (IB).^{14,18,20–21}
- G. Decontaminate hands after contact with body fluids or excretions, mucous membranes, nonintact skin, and wound dressings if hands are not visibly soiled (IA).¹⁵
- H. Decontaminate hands if moving from a contaminated-body site to a clean-body site during patient care (II).^{18,22}
- I. Decontaminate hands after contact with inanimate objects (including medical equipment) in the immediate vicinity of the patient (II).^{22–24}
- J. Decontaminate hands after removing gloves (IB).^{25–27}
- K. Before eating and after using a restroom, wash hands with a nonantimicrobial soap and water or with an antimicrobial soap and water (IB).^{28–33}
- L. Antimicrobial-impregnated wipes (ie, towelettes) may be considered as an alternative to washing hands with nonantimicrobial soap and water. Because they are not as effective as alcohol-based hand rubs or washing hands with an antimicrobial soap and water for reducing bacterial counts on the hands of healthcare workers they are not a substitute for using an alcohol-based hand rub or antimicrobial soap (IB).^{34,35}
- M. Wash hands with nonantimicrobial soap and water or with antimicrobial soap and water if exposure to *Bacil-*

lus anthracis is suspected or proven. The physical action of washing and rinsing hands under such circumstances is recommended because alcohols, chlorhexidine, iodophors, and other antiseptic agents have poor activity against spores (II).^{36–39}

- N. No recommendation can be made regarding the routine use of nonalcohol-based hand rubs for hand hygiene in healthcare settings. Unresolved issue.

2. Hand-hygiene technique

- A. When decontaminating hands with an alcohol-based hand rub, apply product to palm of one hand and rub hands together, covering all surfaces of hands and fingers, until hands are dry (IB).^{40,41} Follow the manufacturer's recommendations regarding the volume of product to use.
- B. When washing hands with soap and water, wet hands first with water, apply an amount of product recommended by the manufacturer to hands, and rub hands together vigorously for at least 15 seconds, covering all surfaces of the hands and fingers. Rinse hands with water and dry thoroughly with a disposable towel. Use towel to turn off the faucet (IB).^{42–46} Avoid using hot water, because repeated exposure to hot water may increase the risk of dermatitis (IB).^{47,48}
- C. Liquid, bar, leaflet, or powdered forms of plain soap are acceptable when washing hands with a nonantimicrobial soap and water. When bar soap is used, soap racks that facilitate drainage and small bars of soap should be used (II).^{49–52}
- D. Multiple-use cloth towels of the hanging or roll type are not recommended for use in healthcare settings (II).^{53,54}

3. Surgical hand antisepsis

- A. Remove rings, watches, and bracelets before beginning the surgical hand scrub (II).^{55–57}
- B. Remove debris from underneath fingernails using a nail cleaner under running water (II).^{58,59}
- C. Surgical hand antisepsis using either an antimicrobial soap or an alcohol-based hand rub with persistent activity is recommended before donning sterile gloves when performing surgical procedures (IB).^{60–65}
- D. When performing surgical hand antisepsis using an antimicrobial soap, scrub hands and forearms for the length of time recommended by the manufacturer, usually 2 to 6 minutes. Long scrub times (eg, 10 minutes) are not necessary (IB).^{66–73}
- E. When using an alcohol-based surgical hand-scrub product with persistent activity, follow the manufactur-

er's instructions. Before applying the alcohol solution, prewash hands and forearms with a nonantimicrobial soap and dry hands and forearms completely. After application of the alcohol-based product as recommended, allow hands and forearms to dry thoroughly before donning sterile gloves (IB).^{61,64}

4. Selection of hand-hygiene agents

- A. Provide personnel with efficacious hand-hygiene products that have low irritancy potential, particularly when these products are used multiple times per shift (IB).^{5,42,44,74,75} This recommendation applies to products used for hand antisepsis before and after patient care in clinical areas and to products used for surgical hand antisepsis by surgical personnel.
- B. To maximize acceptance of hand-hygiene products by healthcare workers, solicit input from these employees regarding the feel, fragrance, and skin tolerance of any products under consideration. The cost of hand-hygiene products should not be the primary factor influencing product selection (IB).^{4,5,44,76-79}
- C. When selecting nonantimicrobial soaps, antimicrobial soaps, or alcohol-based hand rubs, solicit information from manufacturers regarding any known interactions between products used to clean hands, skin care products, and the types of gloves used in the institution (II).^{80,81}
- D. Before making purchasing decisions, evaluate the dispenser systems of various product manufacturers or distributors to ensure that dispensers function adequately and deliver an appropriate volume of product (II).⁸²
- E. Do not add soap to a partially empty soap dispenser. This practice of "topping off" dispensers can lead to bacterial contamination of soap (IA).^{83,84}

5. Skin care

- A. Provide healthcare workers with hand lotions or creams to minimize the occurrence of irritant contact dermatitis associated with hand antisepsis or handwashing (IA).^{85,86}
- B. Solicit information from manufacturers regarding any effects that hand lotions, creams, or alcohol-based hand antiseptics may have on the persistent effects of antimicrobial soaps being used in the institution (IB).^{80,87,88}

6. Other aspects of hand hygiene

- A. Do not wear artificial fingernails or extenders when having direct contact with patients at high risk (eg, those in intensive-care units or operating rooms) (IA).⁸⁹⁻⁹²

- B. Keep natural nails tips less than $\frac{1}{4}$ inch long (II).⁸⁹
- C. Wear gloves when contact with blood or other potentially infectious materials, mucous membranes, and nonintact skin could occur (IC).⁹³
- D. Remove gloves after caring for a patient. Do not wear the same pair of gloves for the care of more than one patient, and do not wash gloves between uses with different patients (IB).^{26,94,95}
- E. Change gloves during patient care if moving from a contaminated body site to a clean body site (II).^{26,94,96}
- F. No recommendation can be made regarding wearing rings in healthcare settings. Unresolved issue.

7. Healthcare worker educational and motivational programs

- A. As part of an overall program to improve hand-hygiene practices of healthcare workers, educate personnel regarding the types of patient-care activities that can result in hand contamination and the advantages and disadvantages of various methods used to clean their hands (II).^{3,97-99}
- B. Monitor healthcare workers' adherence to recommended hand-hygiene practices and provide personnel with information regarding their performance (IA).^{3,77,97,99-101}
- C. Encourage patients and their families to remind healthcare workers to decontaminate their hands (II).^{103,104}

8. Administrative measures

- A. Make improved hand-hygiene adherence an institutional priority and provide appropriate administrative support and financial resources (IB).^{3,104}
- B. Implement a multidisciplinary program designed to improve adherence of health personnel to recommended hand-hygiene practices (IB).^{3,104}
- C. As part of a multidisciplinary program to improve hand-hygiene adherence, provide healthcare workers with a readily accessible alcohol-based hand-rub product (IA).^{3,5,7-9}
- D. To improve hand-hygiene adherence among personnel who work in areas in which high workloads and high intensity of patient care are anticipated, make an alcohol-based hand rub available at the entrance to the patient's room or at the bedside, in other convenient locations, and in individual pocket-sized containers to be carried by healthcare workers (IA).^{3,5,7,9,105-108}
- E. Store supplies of alcohol-based hand rubs in cabinets or areas approved for flammable materials (IC).

PERFORMANCE INDICATORS

The following performance indicators are recommended for measuring improvements in healthcare workers' hand-hygiene adherence:

- A. Periodically monitor and record adherence as the number of hand-hygiene episodes performed by personnel/number of hand-hygiene opportunities, by ward or by service. Provide feedback to personnel regarding their performance.
- B. Monitor the volume of alcohol-based hand rub (or detergent used for handwashing or hand antisepsis) used per 1,000 patient-days.
- C. Monitor adherence to policies dealing with wearing of artificial nails.
- D. When outbreaks of infection occur, assess the adequacy of healthcare worker hand hygiene.

Appendix

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Chair: Robert A Weinstein, MD, Cook County Hospital, Chicago, IL; Co-Chair: Jane D Siegel, MD, University of Texas Southwestern Medical Center, Dallas, TX; Executive Secretary: Michele L Pearson, MD, CDC, Atlanta, GA; Members: Raymond YW Chinn, MD, Sharp Memorial Hospital, San Diego, CA; Alfred DeMaria Jr, MD, Massachusetts Department of Public Health, Jamaica Plain, MA; Elaine L Larson, PhD, Columbia University School of Nursing, New York, NY; James T Lee, MD, PhD, University of Minnesota, Minneapolis, MN; William A Rutala, PhD, University of North Carolina, Chapel Hill, NC; William E Scheckler, MD, University of Wisconsin, Madison, WI; Marjorie A Underwood, Mt Diablo Medical Center, Concord, CA

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